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Ninyo & Moore
Geotechnical and Environmental Sciences Consultants

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ENVIRONMENTAL MANAGEMENT

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January 12, 2006
Project No. 301646001

Mr. John Krause
U.S. Department of the Interior
Bureau of Indian Affairs
Western Regional Office
Two Arizona Center
400 North 5th Street
Phoenix, Arizona 85004

Subject: Proposal for Scope Modification to Purchase Order #SMH00040268
Modification #1
Soil and Groundwater Assessment
Hecla Mining Company Apex Site Pond No. 2
St. George, Utah

Dear Mr. Krause:

We are pleased to provide our proposal to perform soil and groundwater assessment at the Hecla Mining Company Apex Site Pond No. 2. The purpose of the proposed work is to assess the soil and groundwater in the vicinity of Pond No. 2 for evidence of past releases from this pond.

Ninyo & Moore has developed a cost estimate for the Removal Option for wastes in Pond No. 2. It was assumed that chemical analyses of the wastes stored in Pond No. 2 would be available from the files of the United States Environmental Protection Agency (USEPA). Chemical analysis information is needed to characterize the wastes so that the costs for off-site disposal may be evaluated. The USEPA has not been able to locate or provide reports of chemical analyses of the wastes in Pond No. 2.

Certain wastes deposited in Pond No. 2 by Hecla Mining Company (Hecla) are reported to exceed the regulatory limit for EP Toxicity in the September 22, 1999, order requiring monitoring, testing, analysis and reporting from USEPA to Hecla. Approximately 23,272 cubic yards of leach tailings are reported to exceed the regulatory limit for arsenic, 1,200 cubic yards of iron sulfate exceed the regulatory limit for arsenic, and 340 cubic yards, from germanium

operations, exceed the regulatory limit for arsenic and cadmium. This information was used in our evaluation of the off-site disposal option.

In addition, we understand that Hecla is proceeding with the on-site encapsulation of wastes in Pond No. 2, in accordance with the USEPA-approved closure plan. That closure plan does not include groundwater monitoring to detect possible leakage from the closed Pond No. 2. Ninyo & Moore proposes to perform soil exploration in areas of past documented seepage from this pond to assess the soil for possible evidence of releases from the pond. Exploratory borings will be converted to groundwater monitoring wells to monitor possible shallow seasonal groundwater beneath the site or leakage from the Pond No. 2 liner. One deep groundwater monitoring well will be installed to a depth of between 200 to 300 feet to sample groundwater within the bedrock beneath the site, downgradient of Pond No. 2. This deep monitoring well will also allow future monitoring of the groundwater downgradient from Pond No. 2. This work is an additional scope of work and a modification of Purchase Order #SMH00040268 Modification #1.

1. SCOPE OF WORK

1.1. Task 1-Soil and Groundwater Exploration

1.1.1. Shallow Groundwater Monitoring Wells

Three, minimum 8-inch diameter, exploratory soil borings will be drilled, using hollow-stem auger drilling methods, at the approximate locations shown on the attached boring location map. One boring will be located at each of the two previously reported seepage areas, at the southwest and east sides of Pond No. 2. A third boring will be located approximately on the north side of Pond No. 2. The exploratory borings will be drilled to a depth approximately 5 feet below the top of the siltstone and sandstone bedrock of the Moenkopi Formation, which is reported at a depth of approximately 20 to 30 feet below the ground surface. The preferred locations of these wells are nearest to the pond and the former seepage areas. It is assumed that access can be obtained for placement of these wells within the Hecla lease boundary. The well locations may be moved if the to-

pography has been altered by site closure or if the wells cannot be placed inside the Hecla lease boundary.

Soil Sampling – Soil samples will be collected from the surface to the bottom of the boring at approximate 5-foot vertical intervals using a drive sampler. Sampling equipment will be decontaminated between sampling events and clean sample liners will be used. A geologist will observe the drilling and prepare a field log of the materials encountered and the depths of the samples collected. Soil samples will be placed in clean glass sample jars, and labeled according to the site location, date, analysis requested, and name of the person collecting the sample, and placed on ice in an ice chest. The soil samples will be transported to an EPA-approved analytical laboratory using chain-of-custody procedures.

Well Installation – Each of the three exploratory soil borings will be converted to a groundwater monitoring well using 2-inch inside diameter Schedule 40 PVC well casing. Approximately 10 feet of screened well casing, with a bottom end cap, will be installed at the bottom of the well across the interface between the top of the bedrock and the overlying soil materials. There is a potential that seasonal perched groundwater might occur at the interface between the overlying alluvium and the top of the siltstone bedrock. It is anticipated that possible fluid releases from Pond No. 2 would likely be detected at the top of the siltstone bedrock. Solid PVC well casing will extend several feet above the ground surface. The annulus around the screened well casing will be filled with a sand filter material to a point approximately 2 feet above the top of the well screen. Approximately 2 feet of bentonite pellets will be placed on top of the sand. The bentonite pellets will be hydrated by adding water, and a cement/bentonite grout will be placed in the annulus from the top of the bentonite pellets to the surface. A PVC slip cap will be placed on top of the well casing, and a locking, aboveground, well cover will be placed over the top of the well casing. Due to an expected lack of water in the shallow wells, it is not anticipated that they will be developed following installation.

Groundwater Sampling – An electrical water level meter will be lowered into each well to measure the static water level within the well casing. If groundwater is detected in the wells, it is anticipated that it will be of limited volume. Therefore, a sample of groundwater will be collected using a clean disposable bailer without the typical prior purging of three casing volumes of water from the well. Groundwater samples will be placed in clean laboratory-supplied bottles. Each sample bottle will be labeled according to the site location, date, analysis requested, and name of the person collecting the sample, and placed on ice, in an ice chest, for transport to the analytical laboratory, under chain-of-custody procedures.

1.1.2. Deeper Groundwater Monitoring Well:

One groundwater monitoring well will be installed to a depth of between approximately 200 and 300 feet below the ground surface. A minimum 10-inch diameter boring will be drilled at the north side of Pond No. 2, using air rotary casing hammer methods. The reported gradient for groundwater flow in the fractured bedrock is from south to north (Shepherd Miller, Inc. 2000). Therefore, the location of this well is in the anticipated downgradient groundwater flow direction from Pond No. 2, where impacts from Pond No. 2 to deeper groundwater would most likely be detected. The location of this well may be modified based upon site access and topography.

Soil Sampling – Samples of encountered materials will be collected at selected intervals using a drive sampler. Each sample will be placed in clean, laboratory-supplied jars, labeled according to the site location, date, analysis requested, and name of the person collecting the sample, and placed on ice in an ice chest. The samples will be transported to an EPA-approved analytical laboratory for analysis. A geologist will observe the drilling and sampling and will prepare a field log showing the materials encountered, sample locations, and groundwater conditions.

Well Installation – The groundwater monitoring well will be constructed using 4-inch inside diameter Schedule 80 PVC well casing. A screened section of well casing, with

an end cap, will be installed approximately 20 feet below and 20 feet above the encountered groundwater level. Solid 4-inch inside diameter Schedule 80 PVC well casing will extend from the top of the screened section to several feet above the ground surface. Sand filter material will be placed in the annulus around the well casing from the bottom of the boring to approximately 10 feet above the top of the screened section. An approximately 5-foot vertical thickness of bentonite pellets will be placed in the annulus above the sand filter material. The bentonite pellets will be hydrated by adding water to the borehole. A cement/bentonite grout will be placed in the borehole from the top of the bentonite pellets to the ground surface. A slip cap will be placed over the top of the well casing at the surface and a locking, aboveground, well cover will be placed over the well casing.

The well will be developed by surging and pumping to remove sediment from the well. Water will be removed from the well casing until relatively sediment-free water is produced. Water from the well will be contained in on-site drums or tanks for disposal following receipt of laboratory reports on the groundwater from this well.

Groundwater Sampling – An electrical water level meter will be lowered into the well to measure the static water level within the well casing. Prior to collecting a groundwater sample a minimum of three casing volumes of water will be removed from the monitoring well, using a clean submersible pump. The temperature, pH, conductivity, and turbidity will be measured until stabilized readings are obtained. Extracted water will be placed in drums for disposal, following receipt of laboratory results. One groundwater sample will be collected from this well using the decontaminated submersible pump and clean polyethylene tubing. The groundwater sample will be placed in clean laboratory supplied bottles. Each sample bottle will be labeled according to the site location, date, analysis requested, and name of the person collecting the sample, and placed on ice, in an ice chest, for transport to the analytical laboratory, under chain-of-custody procedures.

1.1.3. Decontamination Procedures

Augers, drilling pipe, soil samplers, submersible pumps and water level measuring equipment will be decontaminated prior to each use. Drilling and sampling equipment will be power washed and the wash water will be contained. Water level measuring equipment will be washed with an Alconox solution, or similar decontaminant solution, then rinsed with de-ionized water. The submersible pump will be rinsed and flushed with an Alconox solution, followed by a rinsing and flushing with a de-ionized water solution. New tubing will be attached to the submersible pump for sampling the deeper well. Clean soil sampling containers and water sampling bottles will be obtained from the analytical laboratory. Decontamination rinse water will be contained in drums for proper disposal in accordance with applicable local, state, and federal requirements.

1.2. Task 2 - Soil and Groundwater Laboratory Analyses

1.2.1. Soil Analyses

Selected soil samples will be analyzed in an EPA-approved analytical laboratory for RCRA-8 Metals (arsenic, barium, cadmium, chromium, mercury, lead, selenium, and silver) with the addition of cobalt, copper, gallium, germanium, iron, manganese, nickel, sodium, tungsten, zinc, and calcium using EPA Methods 6010A, 6010AT, 6010BT, and 7471. Selected soil samples will be analyzed for total petroleum hydrocarbons (TPH) as gasoline, diesel, motor oil, and benzene, toluene, ethylbenzene and total xylenes (BTEX) using EPA Method 8015M. Selected soil samples will also be analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) using EPA Methods 8260 and 8270, respectively.

1.2.2. Groundwater Analyses

Groundwater samples will be analyzed for arsenic, barium, cadmium, chromium, mercury, lead, selenium, silver, cobalt, copper, gallium, germanium, iron, manganese, mercury, nickel, sodium, tungsten, zinc and calcium using the EPA 200 series method. Additional analyses will include VOCs and SVOCs using EPA Methods 8260 and 8270,

respectively and TPH as gasoline, diesel, motor oil, and BTEX using EPA Method 8015M.

1.3. Task 3 - Report Preparation

Ninyo & Moore will prepare a written report summarizing the results of: (1) assessment of soil and shallow groundwater in the vicinity of historical seeps at Pond No. 2, and (2) assessment sampling and analysis of deeper groundwater beneath the site. If the results of this assessment program indicate that there may have been releases from Pond No. 2 to soil and groundwater, this information may support the Off Site Disposal Option for wastes currently in Pond No. 2.

2. ESTIMATED COSTS

We estimate the fees for this work is $27,378 (twenty-seven thousand three hundred seventy-eight dollars) for Ninyo & Moore fees and $65,964 (sixty five thousand nine hundred sixty-four dollars) for outside costs for a total estimated fee of $93,342 (ninety three thousand three hundred forty-two dollars). The drilling and well installations will be performed by a licensed drilling contractor with charges based upon unit rates. Actual charges will be on a time-and-materials basis in accordance with the unit rates in Purchase Order # SMH00040268. A breakdown of estimated fees is shown in the attached Table 1.

3. SCHEDULE

We anticipate that drilling can begin within approximately 2 weeks following your authorization to proceed, provided that access to the site is secured. The soil borings and wells can be installed and sampled within an additional 3 weeks. The laboratory reports should be available within 10 working days following sampling. A draft report can be available within an additional 2 weeks following receipt of the laboratory reports.

AUTHORIZATION

If you are in agreement with the scope and cost in this proposal please provide written authorization for Ninyo & Moore to proceed. We appreciate the opportunity to be of service on this project.

Sincerely,
NINYO & MOORE

Albert Ridley, P.G.
Senior Geologist

Robert M. Troisi, C.E.M.
Managing Principal
Environmental Sciences Division

APR/RMT/ltk

Distribution: (2) Addressee

Attachments: Table 1, Breakdown of Fee
Figure 1, Proposed Monitoring Wells

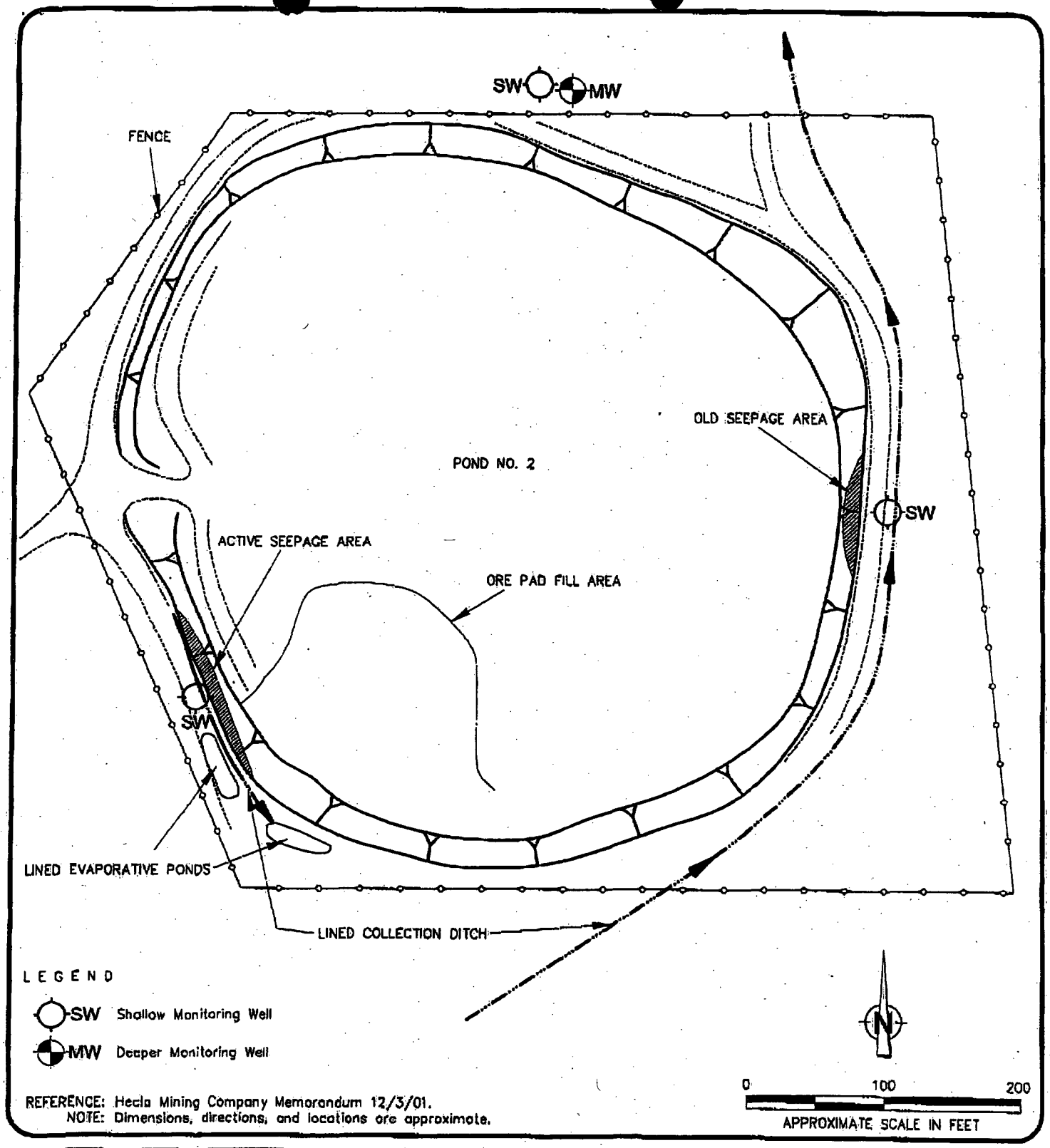
TABLE 1 - BREAKDOWN OF FEE

SOIL BORINGS AND SHALLOW WELL INSTALLATION							Ninyo & Moore Costs	Outside Costs
Senior Project Engineer/Geologist	8 hours	@	$ 115.00	/hour	$	920.00		
Staff Engineer/Geologist	24 hours	@	$ 90.00	/hour	$	2,160.00		
Vehicle	24 hours	@	$ 15.00	/hour	$	360.00		
Per Diem	3 days	@	$ 100.00	day	$	300.00		
Drilling Contractor	$ 10,380.00	unit rates	@	1.00	unit rates			$ 10,380.00
Soil Disposal	$ 1,000.00	unit rates	@	1.00	unit rates			$ 1,000.00
Analytical Laboratory	$ 11,676.00	unit rates	@	1.00	unit rates			$ 11,676.00
Subtotal							$ 3,740.00	$ 23,056.00

DEEPER GROUNDWATER MONITORING WELL INSTALLATION								
Principal Engineer/Geologist	4 hours	@	$ 140.00	/hour	$	560.00		
Senior Project Engineer/Geologist	40 hours	@	$ 115.00	/hour	$	4,600.00		
Senior Staff Engineer/Geologist	56 hours	@	$ 95.00	/hour	$	5,320.00		
Vehicle	56 hours	@	$ 15.00	/hour	$	840.00		
Per Diem	4 days	@	$ 100.00	day	$	400.00		
Drill Rig (Subcontractor)	$ 32,130.00	unit rates	@	1.00	unit rates			$ 32,130.00
Well Development (Subcontractor)	$ 2,420.00	unit rates	@	1.00	unit rates			$ 2,420.00
20 cu yd Soil Roll off Bin (Subcontractor)	$ 2,360.00	unit rates	@	1.00	unit rates			$ 2,360.00
Water disposal	$ 5.00	drums	@	$ 50.00	drum	$	250.00	$ 250.00
Soil disposal	$ 10.00	cu yds	@	$ 50.00	/cu yd	$	500.00	$ 500.00
Transport soil/water to Las Vegas	$ 800.00	unit rates	@	$ 1.00	unit rates	$	800.00	$ 800.00
Analytical Laboratory	$ 4,448.00	unit rates	@	1.00	unit rates			$ 4,448.00
Subtotal							$ 13,270.00	$ 42,908.00

REPORT PREPARATION								
Principal Engineer/Geologist	16 hours	@	$ 140.00	/hour	$	2,240.00		
Senior Project Engineer/Geologist	24 hours	@	$ 115.00	/hour	$	2,760.00		
Senior Staff Engineer/Geologist	40 hours	@	$ 95.00	/hour	$	3,800.00		
Technical Illustrator	16 hours	@	$ 53.00	/hour	$	848.00		
Word Processing	6 hours	@	$ 45.00	/hour	$	270.00		
Reproduction	10 hours	@	$ 45.00	/hour	$	450.00		
Subtotal							$ 10,368.00	

	Ninyo & Moore Costs	Outside Costs
SUBTOTALS	$ 27,378.00	$ 65,964.00
TOTAL ESTIMATED FEE		$ 93,342.00



REFERENCE: Hecla Mining Company Memorandum 12/3/01.
NOTE: Dimensions, directions, and locations are approximate.

Ninyo & Moore

PROPOSED MONITORING WELLS

HECLA MINING COMPANY
APEX SITE POND NO. 2
ST. GEORGE, UTAH

PROJECT NO.	DATE	FIGURE
301646001	11/05	1

WESTERN REGIONAL OFFICE
BUREAU OF INDIAN AFFAIRS
DIVISION OF ENVIRONMENTAL
MANAGEMENT

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